Trend Study 30-38-03

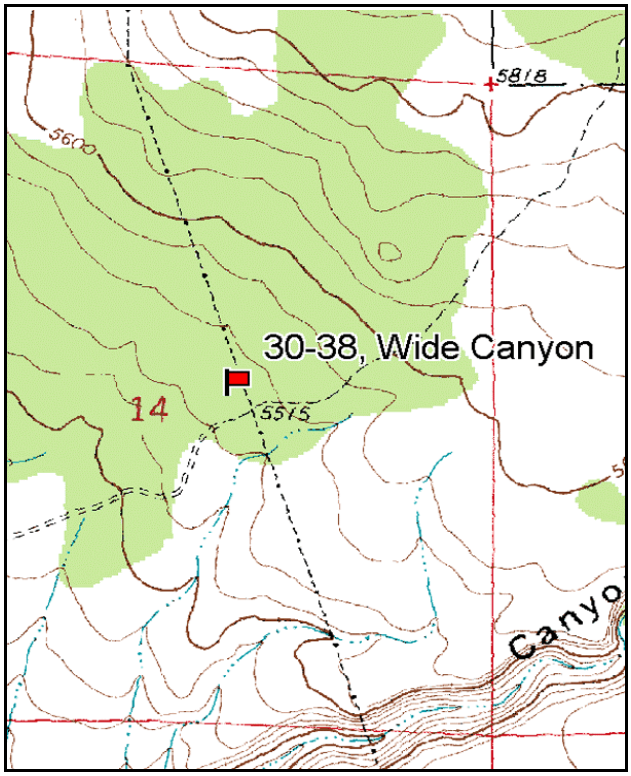
Study site name: Wide Canyon . Vegetation type: Mountain Brush .

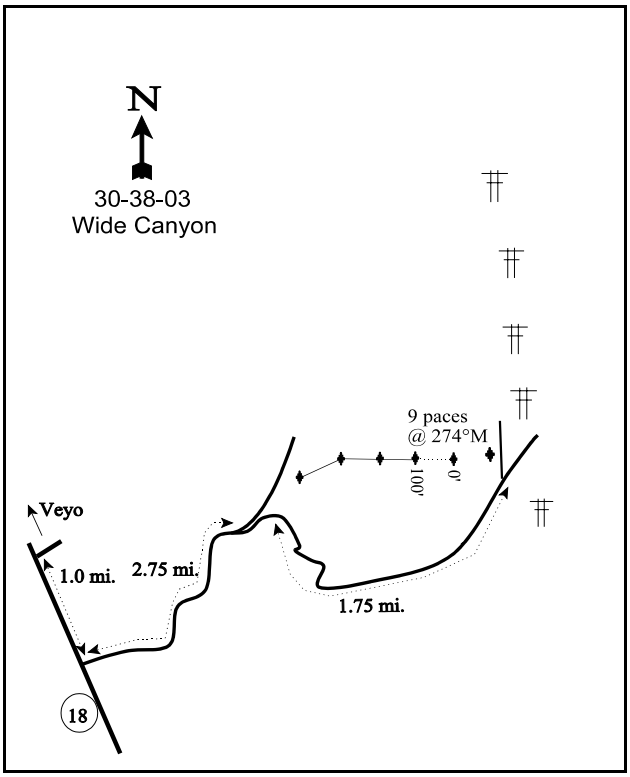
Compass bearing: frequency baseline 276 degrees magnetic. (Line 4, 228°M)

Frequency belt placement: line 1 (8 & 85ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the town of Veyo, proceed south 3.8 miles, at which point a road takes off to the east. Proceed east on this road for approximately 2.75 miles to a fork in the road. Take the right fork for an additional 1.75 miles to the point where the road crosses under power lines. At this point there is a road going north. The witness post is about 100 yards down this road. From the witness post the 0-foot stake is 9 paces at 274 degrees magnetic. The study is marked by green steel "T" fence posts approximately 12 to 18 inches in height. Line 3 is only 90 feet long.





Map Name: Saddle Mountain

Diagrammatic Sketch

Township 40S , Range 16W , Section 14

GPS: NAD 27, UTM 12S 4132034 N, 268401 E

DISCUSSION

Wide Canyon - Trend Study No. 30-38

This trend study is located on deer winter range at 5,500 feet on the north side of Wide Canyon. The study site slopes gently (3-5%) to the southwest. Vegetational characteristics of the community are essentially two-tiered. There is a scattered overstory of Utah juniper and large tree-like Stansbury cliffrose underlain by a rather sparse cover of lower growing shrubs and a dense carpet of cheatgrass brome. Perennial grasses and forbs are nearly nonexistent. Deer use, estimated by a nearby DWR pellet group transect, averaged 23 deer days use/acre (57 ddu/ha) between 1982 and 1992, with a high of 39 days use/acre (96 ddu/ha) in 1989-90, and a low of 14 (35 ddu/ha) in 1991-92. Pellet group data taken along the study site baseline in 1998 estimated a much higher level of use at 121 deer days use/acre (299 ddu/ha). A few cattle pats were also encountered. Pellet group data from 2003 estimated 64 deer days use/acre (158 ddu/ha) and 11 cow days use/acre (27 cdu/ha). About one-half of the deer pellet groups appeared to be from winter use and the remainder appeared to be from spring use.

This study is located on the same lava flow on which the Truman Bench study resides, but approximately 3 miles further away and 1,200 feet lower in elevation. On this site, there are still many variable sized basalt rocks littering the ground surface. However, these are interspersed with larger areas occupied by smaller size fragments. Much of this finer material has probably been deposited through sedimentation from above. Effective rooting depth was estimated at almost 17 inches. Soil texture is a clay loam which is slightly acidic (pH 6.5). Soil temperature was high averaging 68°F at an average depth of 14 inches in 2003. This would indicate a relatively dry soil profile when this site was sampled in late May of 2003. Drought conditions have been present in this area for several years, especially during the spring periods (April - June). Total precipitation at Veyo was only 37% of normal for 2002 and the spring period of that year was only 5% of normal. Spring precipitation for 2003 was 87% of normal but this is obviously not enough to recharge the dry soil profile. Erosion is not a problem on this site due to the level terrain, combined with adequate protective ground cover.

The key browse species are mountain big sagebrush and Stansbury cliffrose. Sagebrush density is low on this site producing only 4% cover in 1998 and 3% in 2003. Density increased from 799 plants/acre in 1982 to 1,599 by 1992, and 1,560 by 1998. Reproduction was good in 1992 with excellent seed production. By 1998, recruitment is still adequate but seed production was poor. Drought conditions have caused the population to decline by 53% to 740 plants/acre. More than half (54%) of the remaining population was classified as decadent in 2003. Utilization of sagebrush on this site has been moderate to heavy during most readings. Young plants also declined in 2003 to just 8% of the population.

The cliffrose plants are principally large tree-like forms which are at least partially unavailable because of height. Utilization of the available portion is moderate to heavy. Since there are no dead plants sampled in 1998, the decline in density since 1992 is primarily due to the much larger sample giving more accurate population estimates. This sample better estimates shrub populations which often have aggregated and/or discontinuous populations. Drought has also negatively effected the cliffrose population causing density to decline and decadence to increase in 2003. Seedling and young recruitment was absent. Green ephedra offers some additional forage for wintering big game. It is moderately abundant but has been mostly unutilized.

The most abundant shrub on the site was broom snakeweed prior to 2003. It provided 16% of the browse cover in 1998 with a density of 7,400 plants/acre. Drought conditions have caused a 99% decline in snakeweed density to a mere 60 plants/acre.

Large juniper trees are found throughout the site. They accounted for 40% of the total browse cover in 1998 and 50% in 2003 with a canopy cover value of 17% and 18% respectively. Point-quarter data from 1998 and 2003 estimated 34 juniper trees/acre with an average basal diameter of 11inches.

The herbaceous understory is very poor and perennial grasses and forbs are quite rare. Cheatgrass brome is very abundant, but was not included in sampling prior to the 1998 reading because it is an annual. During the 1998 reading, cheatgrass produced a cover value of 23% which made up 99% of the total grass cover. A few perennial grasses including galleta, Indian ricegrass, and bottlebrush squirreltail are occasionally found. Forbs combine to produce less than 2% cover. The most common species are annuals.

1982 APPARENT TREND ASSESSMENT

Soil is a limiting factor on this site. Current soil condition is fair to poor and not noticeably improving. Although the rate of erosion is not great, it is probably enough to prevent any immediate improvement. Vegetative trend appears to be declining. The key browse species are rather static with little evidence of reproduction, but also little decadence. However, sagebrush vigor is below optimum. Broom snakeweed and cheatgrass brome are both overly abundant and show few signs of becoming less so.

1992 TREND ASSESSMENT

Vegetative basal cover has remained the same at 1%, which is extremely low. The vegetative cover would undoubtedly be higher if cheatgrass brome were counted. Rock and pavement cover combined have increased slightly from 32% cover to 39%. Litter cover has decreased from 55% to 41%. Overall, soil is not eroding and the changes in cover are slight, indicating a stable soil trend. Grass and forb species are slightly increasing and are not utilized much on this site. Browse density has increased by 24%, due mostly to broom snakeweed and mountain big sagebrush. The increase in mountain big sagebrush is encouraging, but the increase in broom snakeweed should be monitored. Broom snakeweed has the possibility of greatly expanding, depending on the survival rate of the seedlings. Browse trend is slightly up.

TREND ASSESSMENT
soil - stable (3)
browse - slightly up (4)
herbaceous understory - stable, but very poor (3)

1998 TREND ASSESSMENT

Trend for soil is stable with similar ground cover characteristics compared to 1992. Trend for browse is down slightly for mountain big sagebrush and stable for cliffrose. However, sagebrush makes up 19% of the browse cover, or more realistically, 80% of the preferred browse cover. Sagebrush remained at a similar density of about 1,560 plants/acre, but nearly that many (1,240 plants/acre) sagebrush are dead. Percent decadence has increased from 8% in 1982, to 19% in 1992, and 29% by 1998. In addition, 61% (280 plants/acre) of the decadent sagebrush were classified as dying (>50% crown death). However, reproduction appears adequate to maintain the current population. Density of cliffrose declined apparently due to the much larger sample used in 1998. Utilization is moderate to heavy on available plants, vigor is normal and there are currently no plants classified as decadent. Another negative aspect of the browse trend is the 47% increase in the density of broom snakeweed from 3,899 to 7,400 plants/acre. Most of the plants are mature (93%) indicating a possibly stable population. Taking these factors into consideration, trend for browse is considered slightly down. Trend for the herbaceous understory is down. Perennial grasses and forbs are lacking and both have declined in sum of nested frequency since 1992. The herbaceous understory is totally dominated by cheatgrass which has a cover value of 23%. It actually accounts for 99% of the grass cover and 93% of the total herbaceous cover.

TREND ASSESSMENT
soil - stable (3)
browse - down slightly (2)
herbaceous understory - down (1)

2003 TREND ASSESSMENT

Trend for soil is essentially stable. Ground cover characteristics have changed slightly but there is still sufficient protective ground cover to prevent most erosion. Trend for browse is down. The key browse species, mountain big sagebrush, has declined 53% in density. The number of plants displaying poor vigor also increased from 18% in 1998 to 35% in 2003. In addition, 60% of the decadent plants sampled (240 plants/acre) were classified as dying (>50% crown death). No seedlings were encountered and young plants were rare. Cliffrose has also declined in density and increased in poor vigor and decadence. Utilization has remained similar between readings, providing evidence that this trend is drought related. One positive aspect of the browse trend also brought on by drought, is the 99% decline in density of broom snakeweed (7,400 plants/acre to 60). The herbaceous understory is still very poor and totally dominated by cheatgrass and annual forbs. Drought conditions did cause a significant decline in the nested frequency of cheatgrass while reducing its cover from 23% to 13%. Only one perennial grass, galleta, was encountered on the site in 2003, and it occurred in only 2 quadrats. The forb composition is still very poor and dominated by annuals. The 13 species found in 2003 produced less than 2% total cover. The most common species were annuals, storksbill and wooly plantain. Trend for the herbaceous understory is down slightly and very poor.

TREND ASSESSMENT
soil - stable (3)
browse - down (1)
herbaceous understory - down slightly (2)

HERBACEOUS TRENDS --
Management unit 30 , Study no: 38

Type	Species	Nested Frequency			Average Cover %	
		'92	'98	'03	'98	'03
G	Agropyron spp.	9	-	-	-	-
G	Bromus tectorum (a)	-	b348	a306	23.06	12.98
G	Hilaria jamesii	-	3	7	.06	.03
G	Oryzopsis hymenoides	-	2	-	.00	-
G	Poa fendleriana	b13	a-	a-	-	-
G	Poa secunda	b22	a-	a-	-	-
G	Sitanion hystrix	b12	b14	a-	.11	-
G	Vulpia octoflora (a)	-	b17	a11	.09	.05
Total for Annual Grasses		0	365	317	23.15	13.04
Total for Perennial Grasses		56	19	7	0.18	0.03
Total for Grasses		56	384	324	23.34	13.07
F	Agoseris glauca	3	-	3	-	.04
F	Alyssum alyssoides (a)	-	2	-	.00	-
F	Calochortus nuttallii	a9	a9	b31	.05	.11
F	Cymopterus spp.	-	-	1	-	.03
F	Descurainia pinnata (a)	-	-	2	-	.01
F	Draba spp. (a)	-	b28	a4	.16	.01

Type	Species	Nested Frequency			Average Cover %	
		'92	'98	'03	'98	'03
F	Erodium cicutarium (a)	-	38	38	.39	.82
F	Gilia spp. (a)	-	$_{a}$-	$_{b}$22	-	.11
F	Lappula occidentalis (a)	-	$_{a}$-	$_{b}$32	-	.15
F	Lupinus argenteus	-	2	-	.04	-
F	Microsteris gracilis (a)	-	$_{b}$65	$_{a}$4	.30	.01
F	Navarretia intertexta (a)	-	-	-	-	.00
F	Plantago patagonica (a)	-	30	27	.47	.32
F	Sphaeralcea grossulariaefolia	8	-	-	-	-
F	Thysanocarpus curvipes	-	2	-	.03	-
F	Unknown forb-annual (a)	-	2	6	.03	.04
F	Viguiera multiflora	-	-	3	-	.03
Total for Annual Forbs		0	165	135	1.37	1.48
Total for Perennial Forbs		20	13	38	0.12	0.21
Total for Forbs		20	178	173	1.50	1.69

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Management unit 30 , Study no: 38

Type	Species	Strip Frequency		Average Cover %	
		'98	'03	'98	'03
B	Artemisia tridentata vaseyana	42	28	4.34	2.58
B	Cowania mexicana stansburiana	6	4	1.17	.93
B	Ephedra viridis	21	23	4.46	4.88
B	Gutierrezia sarothrae	76	3	3.73	.06
B	Juniperus osteosperma	5	4	9.19	9.00
B	Prunus fasciculata	1	1	.15	.63
B	Yucca baccata	1	0	-	-
Total for Browse		152	63	23.05	18.08

CANOPY COVER, LINE INTERCEPT --
Management unit 30 , Study no: 38

Species	Percent Cover	
	'98	'03
Artemisia tridentata vaseyana	-	2.18
Cowania mexicana stansburiana	-	2.61
Ephedra viridis	-	6.55
Gutierrezia sarothrae	-	.01
Juniperus osteosperma	16.79	18.13
Prunus fasciculata	-	.36

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 30 , Study no: 38

Species	Average leader growth (in)
	'03
Artemisia tridentata vaseyana	2.7

POINT-QUARTER TREE DATA --
Management unit 30 , Study no: 38

Species	Trees per Acre	
	'98	'03
Juniperus osteosperma	34	34

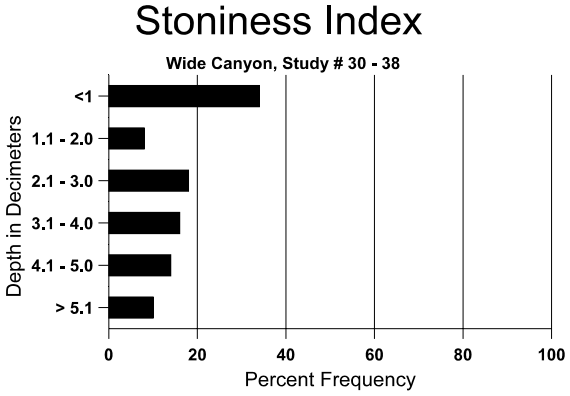
Average diameter (in)	
'98	'03
12.4	10.2

BASIC COVER --
Management unit 30 , Study no: 38

Cover Type	Average Cover %		
	'92	'98	'03
Vegetation	.75	45.48	32.25
Rock	28.25	23.15	23.25
Pavement	10.75	6.17	3.37
Litter	41.00	44.79	43.21
Cryptogams	4.00	1.56	.17
Bare Ground	15.25	14.72	14.47

SOIL ANALYSIS DATA --
Management unit 30, Study no: 38, Study Name: Wide Canyon

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	ds/m
16.6	68.0 (14.1)	6.5	40.0	33.4	26.6	1.4	11.1	150.4	0.6



PELLET GROUP DATA --
Management unit 30 , Study no: 38

Type	Quadrat Frequency	
	'98	'03
Rabbit	12	24
Cattle	-	-
Deer	45	32

Days use per acre (ha)	
'98	'03
-	-
2 (5)	11 (27
121 (299)	64 (157)

BROWSE CHARACTERISTICS --
Management unit 30 , Study no: 38

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Artemisia tridentata vaseyana											
82	**799**	-	33	700	66	-	21	13	8	8	22/26
92	**1599**	300	733	566	300	-	69	13	19	6	19/23
98	**1560**	60	340	760	460	1240	23	3	29	18	17/24
03	**740**	-	60	280	400	1540	14	16	54	35	15/21
Cowania mexicana stansburiana											
82	**466**	-	-	466	-	-	57	14	0	0	32/31
92	**466**	133	200	100	166	-	21	29	36	7	33/29
98	**120**	100	20	100	-	-	33	33	0	0	85/85
03	**80**	-	-	40	40	-	50	25	50	0	82/82
Ephedra viridis											
82	**200**	-	-	200	-	-	0	0	0	0	24/26
92	**300**	-	100	200	-	-	33	0	0	0	24/36
98	**480**	-	20	440	20	20	13	8	4	4	34/40
03	**500**	-	40	400	60	20	4	0	12	4	33/44

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Gutierrezia sarothrae											
82	**3265**	-	266	2833	166	-	0	0	5	5	8/9
92	**3899**	30033	466	3400	33	-	0	0	1	3	13/12
98	**7400**	280	260	6880	260	280	0	0	4	2	8/10
03	**60**	-	-	60	-	340	0	0	0	0	14/18
Juniperus osteosperma											
82	**33**	-	33	-	-	-	0	0	-	0	-/-
92	**33**	66	33	-	-	-	0	0	-	0	-/-
98	**140**	-	40	100	-	-	0	0	-	0	-/-
03	**100**	-	20	80	-	-	0	0	-	0	-/-
Prunus fasciculata											
82	**0**	-	-	-	-	-	0	0	-	0	-/-
92	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**20**	-	-	20	-	-	0	0	-	0	25/59
03	**20**	-	-	20	-	-	0	0	-	0	31/65
Yucca baccata											
82	**0**	-	-	-	-	-	0	0	-	0	-/-
92	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**20**	-	-	20	-	-	0	0	-	0	33/45
03	**0**	-	-	-	-	-	0	0	-	0	37/56